

What is claimed is:

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A 2 > 1. A method of expressing a tumor specific therapeutic response element in a cancerous cell in which the response element was blocked from expression, comprising the step of administering an unblocking agent to the cancerous cell harboring a gene encoding the response element, thereby resulting in the expression of the response element.

2. The method according to claim 1, wherein said response element is endogenous to the cancerous cell.

3. The method according to claim 1, wherein said response element is exogenous to the cancerous cell.

4. The method according to claim 1, wherein said cancerous cell is dedifferentiated, and as a result of said administration said response element is re-expressed.

5. The method according to claim 1, wherein said gene encoding the response element is methylated on CpG islands in a regulatory or coding region of the gene.

6. The method according to claim 5, wherein said unblocking agent is a demethylating agent.

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A 3 > 7. The method according to claim 6, wherein said demethylating agent is dimethylsulfoxide, sodium butyrate, phenylacetate, or 5-azacytidine.

8. The method according to claim 6, wherein said demethylating agent is a compound that inhibits DNA-methyltransferase activity.

9. The method according to claim 1, wherein said unblocking agent is an agent that inhibits methylation by depleting polyamines.

Sub A4 → 10. The method according to claim 9, wherein said unblocking agent is difluoromethylornithine (DFMO), and adenosyl-1,8-diamino-3-thio-octane.

11. The method according to claim 5, wherein said regulatory region is an untranslated region within the first exon.

Sub A5 → 12. The method according to claim 1, wherein said response element is a sodium-iodide symporter (NIS).

13. The method according to claim 12, wherein said response element is a human sodium-iodide symporter (hNIS).

14. The method according to claim 1, wherein said response element is unblocked by activation of a transcriptional activator specific for said response element.

Sub A6 → 15. The method according to claim 1, wherein said cancerous cell is a thyroid-derived cell.

16. A method of restoring iodide transport to dedifferentiated thyroid cancer cells comprising the step of administering a demethylating agent in an amount effective to transcriptionally activate a tumor specific therapeutic response element in a cell that is defective in iodide transport, wherein said tumor specific therapeutic response element is the sodium iodide symporter.

17. A method of treating a tumor by expressing a tumor specific therapeutic response element in a cancerous cell in which the response element was blocked from expression, which comprises the steps of:

5 a) administering an unblocking agent to the cancerous cell harboring a gene encoding the response element, thereby resulting in the expression of the response element; and
b) administering a therapeutic substance to target said tumor specific therapeutic response element.

18. The method according to claim 17, wherein said therapeutic substance

is radioactive iodine.

19. The method according to claim 17, wherein said therapeutic substance comprises an antibody specific for said response element.

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